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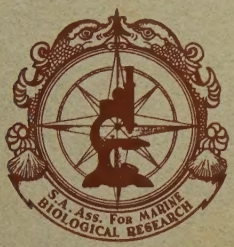

OCEANOGRAPHIC RESEARCH INSTITUTE

Investigational Report No. 2

SHARK ATTACK OFF THE EAST COAST OF SOUTH AFRICA 24 DECEMBER 1960, WITH NOTES ON THE SPECIES OF SHARK RESPONSIBLE FOR THE ATTACK

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SHARK ATTACK OFF THE EAST COAST OF SOUTH AFRICA ON 24 DECEMBER, 1960 WITH NOTES ON THE SPECIES OF SHARK RESPONSIBLE FOR THE ATTACK

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The circumstances of a shark attack on 16 year old Michael Hely at Amanzimtoti, Natal in April, 1960 have been described by Davies (1960) and Campbell *et al* (1960). As a result of a detailed study of Hely's wounds the shark responsible for the attack was identified as a Ragged-toothed Shark *Carcharias taurus* Rafinesque. The wounds were characterised by the presence of deep, narrow grooves in the hip bone (iliac crest) of the victim and greatly serrated skin edges. In spite of the severity of his wounds, Michael Hely has made a complete recovery.

A second, and this time fatal shark attack took place in 1960 at Margate, a resort town on the Natal South Coast, 86 miles from Durban. Particulars of the victim, details of the circumstances of the attack and the subsequent investigation leading to the identification of the shark responsible are given as follows:

Particulars of the Victim

The victim, Petrus Sithole, was an African male aged about 25 years. He was wearing light blue swimming trunks and a silver ring on the third finger of his left hand. The colour of his skin was dark.

Locality of Attack and Accompanying Conditions

Sithole was swimming in murky water outside the shark barrier at Margate beach. His exact position at the time of the attack is marked by a cross in the diagram (see *Fig. 1*). The attack took place at 4.30 p.m. on December 24, 1960. The sky was overcast at the time, the temperature of the water was 24°C and the victim was swimming in a channel 8-10 feet deep, approximately 200 feet from the shore. The condition of the tide was low and incoming.

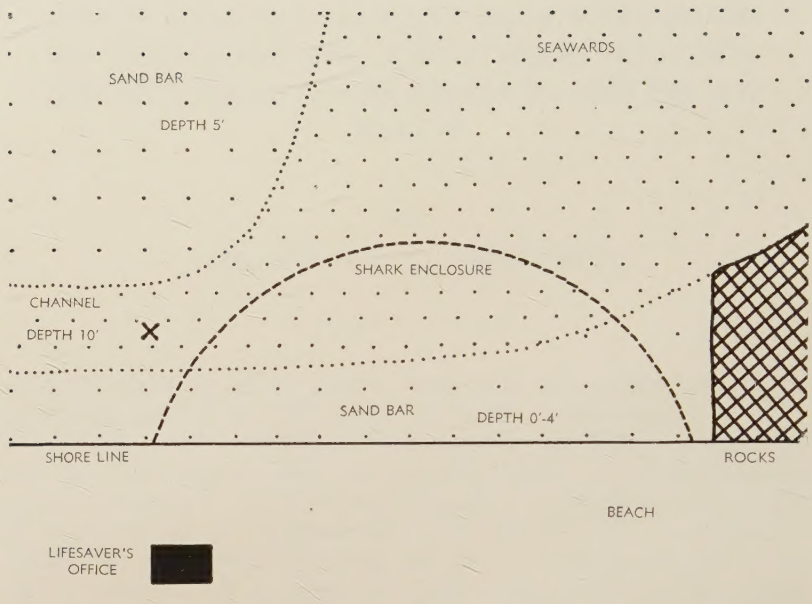

Fig. 1. Diagram showing position of attack.

Description of Attack

The victim was seen to be swimming vigorously when suddenly he screamed and, with his arms flailing, the upper half of his body came vertically out of the water. His cries ceased and he was seen to fall forward. The surrounding water became red with blood but the discolouration rapidly disappeared. Two Africans swimming on the sandbank beyond the victim swam ashore recrossing the channel without attempting to help him. Waves washed him in towards the shore and a man who had been standing on the beach ran in waist-deep and dragged him out.

On being brought to the beach it was seen that both legs had been severed and bleeding had already ceased. Artificial respiration was given immediately, and the victim was taken to the Port Shepstone Hospital. It is likely that he was already dead when he reached the beach.

Description of Wounds

Detailed examination of the body on the morning following the attack revealed that the entire left leg had been severed, tearing away part of the victim's swimming trunks (see *Fig. 2*). The skin edges of the wound were for the most part evenly cut with only a small area of torn edges. The top of the femur appeared to have been shattered by a terrific blow but there were no signs of tooth marks on the bone.

The right leg had been cleanly removed at the knee and the undamaged distal end of the femur protruded through the muscle tissue. No tooth marks on the bone were seen.

An extensive, longitudinal skin abrasion was found in the central, lower chest/upper abdominal region. The abrasion was about 1 inch wide and 7 inches in length and was said to have been bleeding slightly at the time of the rescue. It is possible that this abrasion was caused by a "bump" made by the shark using its "nose" prior to the attack, Coppleson (1959) or it could have been caused during the attack.

The wounds on Sithole's legs were widely different from Hely's abdominal wound, Campbell *et al.* (1960). Sithole's wounds were neat, clean-cut amputations while Hely's main wound was characterised by an irregular, torn appearance and the deeply serrated nature of the skin edges.

X-ray photographs taken at the Port Shepstone Hospital revealed the presence of fragments of two teeth (see *Fig. 3*) embedded in the bone in the distal end of the femur of the right leg in the region of the knee. These fragments were removed by the District Surgeon, Port Shepstone at a *post mortem* operation.

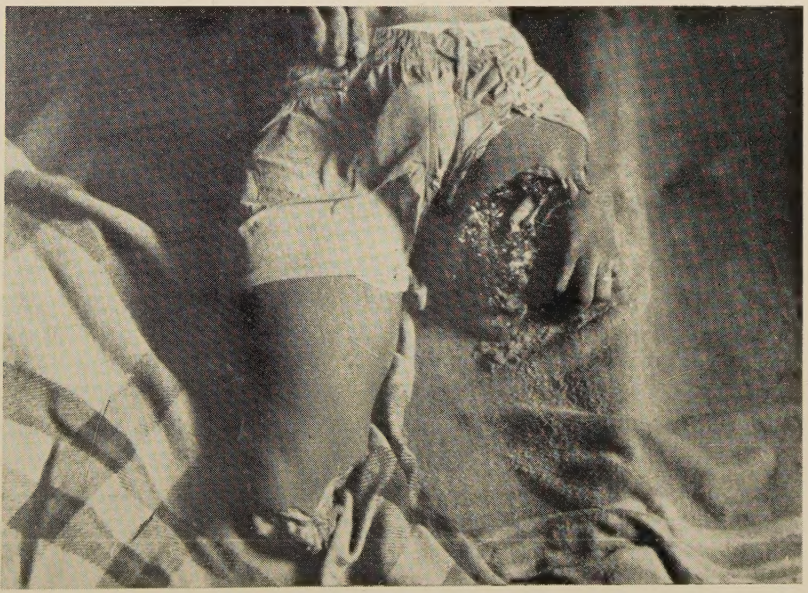

FIG. 2. Clean-cut wounds of victim.

FIG. 3 X-ray photograph showing end of right femur with shark tooth fragments embedded in bone.

STUDY OF TEETH FOUND IN WOUNDS

A careful study of the tooth fragments (see *Fig. 4*) and direct comparison between the two fragments and entire teeth in the collection of jaws held by the Oceanographic Research Institute, Durban, enabled an identification to be made of the species of shark responsible for the attack, using a provisional name.

One tooth fragment corresponded almost exactly with the antero-lateral teeth of the upper jaw and the other fragment with the antero-lateral teeth of the lower jaw of specimens of a *Carcharinid* species. Both tooth fragments belonged to teeth larger than those of the largest specimen which weighed 903 lbs. and was 9 feet 5 inches (2,835 mm.) in total length and presumably belonged to a shark of larger size.

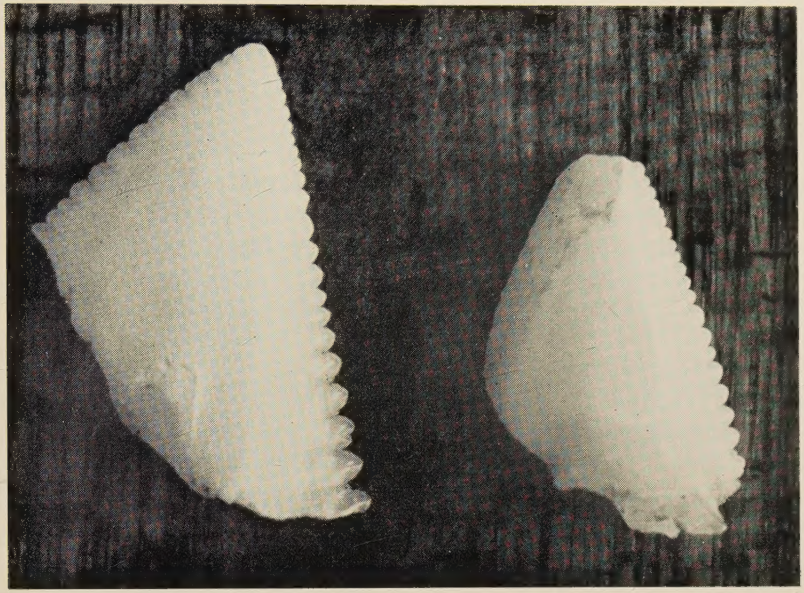

FIG. 4. Tooth fragments found in Sithole's femur.

IDENTIFICATION OF SPECIES RESPONSIBLE FOR THE ATTACK

A survey of the sharks of the Natal region was begun by the Oceanographic Research Institute, Durban in 1959. Detailed studies of over 200 specimens have been carried out (Dec. 1960) and it has become evident that the taxonomy of the sharks of this region is in need of extensive revision.

The tooth fragments left in Sithole's femur were found to be those of a species of *Carcharinus* which is common along the Natal coast and will be called Species A for convenience. It is frequently encountered in shallow, discoloured water in the vicinity of river mouths and estuaries and is characterised by a heavy blunt-nosed appearance, wide mouth, small eyes and great agressiveness.

During the course of the survey, 17 specimens of species A have so far been obtained. These consist of 1 adult male, 6 large maturing males and 10 large females. In addition, large numbers of photographs of this species taken by anglers have been examined.

Species A shows a close similarity to the following four species of *Carcharinus* based on the descriptions listed below:

1. *Carcharinus zambezensis* Peters—description from an immature male, Peters (1868).
2. *C.nicaraguensis* (Gill and Bransford)—description from 4 males (one immature) and from photographs of 2 females, Bigelow and Schroeder (1948).
3. *C.leucas* (Müller and Henle)—description from 3 immature females (one possibly an embryo), 3 embryos (2 of which were males), the skin of an immature female, the head of a specimen and tracings of the fins of a large male, Bigelow and Schroeder (1948).
4. *C.vanrooyeni* Smith—photographs of 2 specimens and photograph of jaws (Smith, 1958), and a partial description of a maturing female, personal communication Smith (1960).

Detailed comparison of species A with descriptions of the above species revealed the following differences:

1. Comparison of Species A and C.zambezensis

The original description and drawings of *C.zambezensis* make the comparison of certain features difficult. For example, the drawings of the denticles and teeth are very small and have been over-simplified. Species A varies from *C.zambezensis* in the following three proportions of the total length:

(*a*) The distance between the anal and caudal fins is 11.1% for *C.zambezensis* and 9.2-10.4% for species A.

(*b*) The distance from nostril to orbit is 3.4% for *C.zambezensis* and 3.8-4.3% for species A.

(*c*) The length of pectoral is 17.8% for *C.zambezensis* and 20.6-24.6% for species A.

It should, however, be borne in mind that the methods of taking measurements may have differed and that in all likelihood the proportions of sharks vary with age—the type being a small, immature specimen.

2. Comparison of Species A with C.nicaraguensis.

(*a*) The head of *C.nicaraguensis* as shown in the figure does not increase in width posterior to the nostrils whereas the head of species A broadens considerably in this region.

(*b*) The posterior lobe of the second dorsal of *C.nicaraguensis* is more slender and is $\frac{1}{2}$ to $\frac{2}{3}$ of its base, whereas species A is $\frac{1}{3}$ to $\frac{1}{2}$ of its base.

3. Comparison of Species A with C.leucas

(*a*) The outline of the snout is more acutely curved and the preoral distance is greater than in species A.

(*b*) The posterior lobe of the second dorsal is $\frac{2}{3}$ the length of its base in *C.leucas* and $\frac{1}{3}$ to $\frac{1}{2}$ in species A.

(*c*) The ridges of the denticles are more widely spaced in *C.leucas*.

(*d*) The diameter of the eye is 50% larger in *C.leucas*

4. Comparison of Species A with C.vanrooyeni.

Insufficient data available for detailed comparison.

In spite of these differences it is possible that this species is conspecific with *C.zambezensis*, *C.nicaraguensis*, *C.leucas* and *C.vanrooyeni*. Confirmation of this will only be possible when a direct comparison of specimens has been made. In the meantime species A will be provisionally designated *C.zambezensis* Peters.

It is of interest to note that all these species are closely associated with the land and fresh water. With the exception of *C.nicaraguensis* which is a landlocked freshwater species, they are all found close inshore near river mouths and often in estuaries. *C.leucas* and *C.zambezensis* have been found considerable distances up rivers. *C.gangeticus* Müller and Henle has a similar habitat and according to Day's figure (1889) is likely to be closely related. The available description, Garman (1913) was not considered adequate for the inclusion of *C.gangeticus* in the above comparison.

Conclusion

The Shark responsible for the fatal attack on an adult African male at Margate, Natal, South Africa was found to be a species common off the Natal coast. This species has been provisionally identified as *Carcharinus zambezensis* Peters.

Acknowledgment

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